Novel automated system for the storage and sorting of surgical instruments

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BACKGROUND

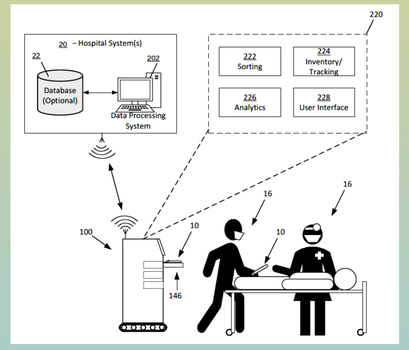
The field of surgery has evolved significantly in recent years. The introduction of robotic surgical systems and the integration of related technologies such as artificial intelligence have begun to impact the performance and monitoring of surgery, patient outcomes, and even the feasibility of surgical capabilities. These tools and systems enable alleviation of human effort and improved precision, reproducibility, cost and outcomes in the delivery of health care. Despite these advancements, the management of surgical tools remains largely manual. The suboptimal management of surgical tools contributes to over half of surgical delays. The disclosed system and process proposes a novel way to automate surgical tool storage, sorting, and tracking to alleviate human effort and error, enable data analytics, and mitigate surgical tool use restrictions related to staffing and environment.

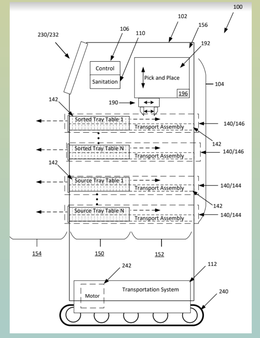
DESCRIPTION

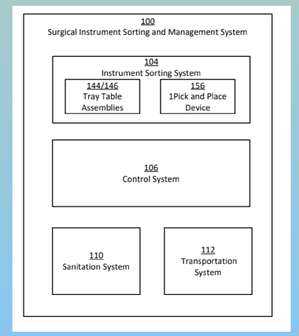
The automated surgical tool device and system features a design that allows for tool reception, storage, sorting, retrieval, and return of surgical instruments within the surgical and perioperative setting. It consists of components designed for mobility, instrument storage and movement, tool organization, and a control system that is capable of surgical tool and tray tracking and recognition. Tracking and recognition capabilities constitute machine learning components to enable the development of surgical tool recommendation, prediction and navigation

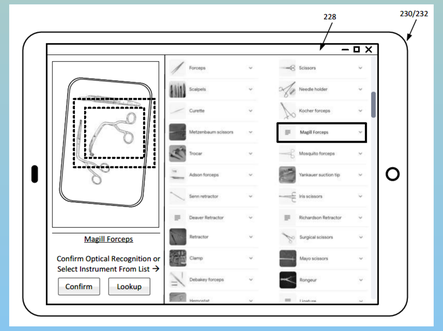
APPLICATION

This automated surgical instrument tracking device and system are intended for use in surgical environments to enhance operational efficiency and resource management. Based on features that are easy to use and partnership with surgical teams for iterative design, use of this robotic instrument management system reduces case turnover and setup time to increase surgical revenue and volume while improving safety and tracking. This automated system delivers and tracks surgical instruments, improving surgical sustainability, safety, and patient access to surgical care.









PRELIMINARY RESULTS

Preliminary assessment in a testing environment of this robotic surgical instrument management device indicate promising outcomes in optimizing workflow and reducing operational complexities. The system's functionality has begun to demonstrate the potential of automating manual workflows in surgical tool storage, sorting, and tracking. Machine learning capabilities in surgical tool recognition are nascent but show potential in surgical tool manipulation and tracking.

CONCLUSION & FUTURE DIRECTIONS

The novel automated system for the storage and sorting of surgical instruments described herein demonstrates the first automated approach to surgical tool management within the setting of the operating room. This presents a significant advancement in surgical tool management that extends the feasibility of performing surgical procedures to a wider array of environments that may be limited by staffing, location, or other factors. Future directions of this technology extend to improvements in tool exchange, usage, design, sustainability, and integration with other surgical technology for the purpose of improving accessibility, cost, and safety of surgical care.

PATENT PENDING

System for storage and sorting of surgical instruments
App # 63/ 603, 410